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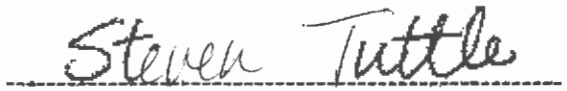

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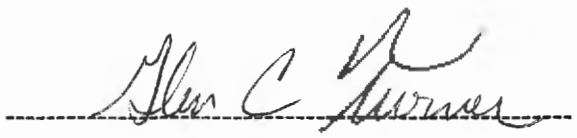

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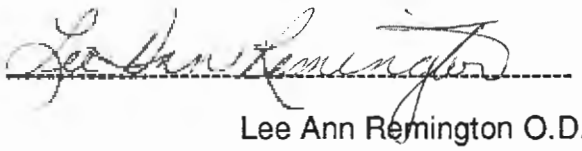

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Abstract

Supervised interns from Pacific University College of Optometry performed standard visual screenings of three separate nursing homes. Residents were evaluated in six major areas: significant history both systemic and ocular, far and near acuity, cover test, refractive status, ophthalmoscopy and tonometry. This information was compared to non-nursing home seniors. A total of 252 subjects were assessed. The incidence of visual impairments was considerably higher for the nursing home population, with nearly 50% of this group more likely to fail the screening. This study suggests that many of the nursing home residents have greater visual potential, but are currently not receiving the care necessary to achieve it. Meeting this potential could significantly reduce their need for supervision and increase their quality of life.

Introduction

Today 5% of those over 65 live in institutions, this is approximately l.5 million people1 . It is projected that 25% of those over 65 will become residents of a nursing home before the end of their life. Growth of this population will increase from the present l.5 million to 2.25 million by the year 2020 2. With the graying of America, demands are being placed on services for seniors. Optometry is no exception with increasing need for eye-care over age 65.

As the median age of the general population increases so will the population of nursing homes. One problem encountered when institutionalizing a large percentage of our population is isolation from specialty health care and in this case, professional eye care. In larger urban and suburban areas there are optometrists and ophthalmologists on staff, but most are"on call" and have no regular contact with patients. Because of busier private and group practices most practitioners don't have time to visit nursing homes, nursing homes don't have the resources to transport patients to individual practices for care, thus leaving a void where individuals are not

receiving needed care.

Work in this area has been minimal with respect to eye-care. A study of 225 nursing home residents by Whitmore evaluated eye disease in nursing homes. He concluded that nursing home residents have a higher prevalence of eye disease than their peers living outside of nursing home care 3 . Newell and Walser screened visual acuity and intraocular pressure in 604 nursing home residents. They found the incidence of significant visual impairment and borderline elevated IOP to be higher in the nursing home population than those of the community screening. They felt that because of untimely medical and surgical treatment significant visual loss will result from the disease 4. Woodruff, Pozza and Gagliardi documented the increasing need for more supervision and nursing care for the visually impaired. They also note that visual loss decreases mobility, thus limiting physical and intellectual activities. They felt that the use of available technology to correct visual loss and blindness would significantly increase the capabilities of a substantial number of nursing home residents 5.

Attitudes toward the elderly need to be changed. A report by Cole and McConnaha noted that 48% of optometrists surveyed viewed patients over the age of 65 as more difficult to deal with than younger patients 6 . Opinions expressed included: "Who cares?", "There is no difference between being old in or out of a nursing home" and "What is there to improve? It won't help their quality of life".

This study will compare senior nursing home residents to community senior citizens screened by optometric students. As a service to the Portland and Washington County areas, seniors are given evaluations of the eye and visual system at community senior centers. These screenings are staffed by optometry students and supervised by a doctor of optometry. Individuals are evaluated on a pass/fail basis with failure indicating that they should be seen by their eye-care professional. Pacific University College of Optometry performs community screenings on a regular basis on all age groups. Subject information was selected at random from these senior

screenings to be used as our control. Screenings were performed in the Portland and Washington County areas. Three area nursing homes participated in our study, one being a convalescent care home and the other two being skilled care facilities.. Residents were screened using the same procedures.mentioned above. Our hypothesis was that individuals in institutional care will fail more of the criteria on the screening than those of the senior community screening.

MATERIAL AND METHODS

Visual screening forms were randomly selected from Pacific University's senior screening files totaling 204 subjects. Three Washington County nursing homes were screened, using Pacific University standard screening technique, totaling 48 subjects. Nursing home subjects were selected by staff members, based on their perception of the subject's ability to participate, not on the basis of a visual or ocular problem. Equipment and forms were provided by Pacific University's College of Optometry. Six different areas were assessed. (1) Visual acuity was evaluated at both l6 inches and 20 feet using a standard Snellen chart. The subject's habitual lenses were worn and best acuity recorded for both left and right eyes. Subjects were classified according to age and grouped as in Table1. (2) Cover tests were performed with small target fixations both at distance and near with greater than 15 prism diopters of exo or esophoria and any tropia were considered as failure. (3) Refractive status was measured with habitual lenses in place. Over-refraction was performed using lens bars. Categories used are in Table 3, which assessed only gross refractive errors. (4) Ophthalmoscopy utilized both direct and monocular indirect techniques to assess ocular and systemic health. Again criteria was on a pass/fail basis, with failures being any abnormal condition or inability to view the fundus. If subjects were failed, reasons were classified into either cataract, age-related macular degeneration or other, as in Table 5. All examinations were done under non-dilated conditions. (5) Tonometry measurements were taken with a Keeler hand-held non-contact tonometer with the

nursing home population and an A.O. NCT for the non-nursing home population. Two to four readings were taken on each eye, with averages taken to be a single value. Failures in this area were IOP's greater than 21mmHg or asymmetrical finding of 4mmHg or greater. Results are shown in Table 4. (6) Personal and family medical histories were given by subjects in the initial case history. Table 6 shows that six categories are used to evaluate health conditions. They are hypertension, diabetes (IDDM and NIDDM), vascular disease (MI, CVA), arthritis, glaucoma, and other.

Table 7 shows overall pass/fail rate. Failure was indicated if any part of the six areas tested were failed, if there was a significant time lapse since their last ophthalmic or medical examination or at the discretion of the advising doctor.

Results

Habitually corrected distant visual acuity in the better eye of all patients is listed by age, acuity level and to either group A (nursing home residents.) or group B (community seniors.) in Table 1

Table 1 PERCENTAGE OF SUBJECTS

Distant V.A.	20/20-20/40		20/50-20/70		20/80-20/200		<20/200	
Age(total #)	A	B	A	B	A	B	A	B
<65 (A=5,B=8)	100	100	0	0	0	0	0	0
65-74(A=7,B=93)	86	92	14	7	0	1	0	0
75-84(A=13,B=84)	62	92	31	5	0	3	7	0
>84(A=17,B=20)	59	60	17	20	12	10	12	10

100% of all those screened under the age of 65 were found to have 20/40 or better acuity. In the age group 65 to 74, group A had 86% while group B had 92% with 20/40 or better acuity. In the same age group, acuity of 20/50 to 20/70 was found in 14% of group A and 7% of group B. 1% of group B had an acuity level of 20/80 to 20/200, no one in either group had acuity less than 20/200. In the age group of 75 to 84 with

acuity level of 20/20 to 20/40, group A showed 62% while group B showed 92%. Acuity of 20/50 to 20/70 for the same age group was 31% group A and 5% group B. Acuity level 20/80 to 20/200 showed group A with 0% and group B with 3%. 7% of group A in this age group (75-84) had acuity worse then 20/200. The 85 or greater age group showed very similar statistics across the different acuity levels, 20/20 to 20/40,group A 59%, group B 60%, 20/50 to 20/70, group A17%, group B 20%, 20/80 to 20/200, group A 12%, group B 10%, less than 20/200 acuity; group A 12%, group B 10%. Table 2 is similar to Table 1 except it is for near visual acuity.

Table 2 **PERCENTAGE OF SUBJECTS**

Near V.A.	20/20-20/40		20/50-20/70		20/80-20/200		<20/200	
Age(total #)	A	B	A	B	A	B	A	B
<65 (A=5,B=8)	40	87	40	13	20	0	0	0
65-74(A=7,B=92)	72	89	14	7	14	4	0	0
75-84(A=13,B=82)	69	87	15	5	8	8	8	0
>84 (A=15,B=20)	46	55	27	30	27	5	0	10

40% of group A as opposed to 87% of group B for the age group under 65 had 20/40 or better near acuity. In this same age group, 40% of group A and 13% of group B had 20/50 to 20/70 acuity. The remaining 20% of group A were in the acuity category of 20/80 to 20/200. No one in either group was screened with less than 20/200 acuity. For the 65 to 74 age group, 72% of group A and 89% of group B had 20/40 or better near acuity. 14% of group A and 7% of group B were within the 20/50 to 20/70 acuity level while another 14% of group A and only 4% of group B had an acuity between 20/80 and 20/200. Again no one in this age group (65 to 74) had an acuity less than 20/200. The percentages were similar for the age group 75 to 84 with 69% of group A (nursing home residents) and 87% of group B (non-nursing home population) had an acuity level of 20/20 to 20/40. 15% of group A and only 5% of group B were in the 20/50 to 20/70 level. Both groups had 8% within the 20/80 to 20/200 acuity category.

The remaining 8% of group A had less than 20/200 acuity. The 85 or greater age group had very similar findings for the first two acuity levels, group A had 46% while group B had 55% with 20/40 or better acuity. In the 20/50 to 20/70 acuity level, group A had 27% and group B had 30%. In the 20/80 to 20/200 level, again group A had 27% while group B had only 5%. Group B, in this 85 years or older group, had 10% with near visual acuity less than 20/200 while the nursing home group had no one in this category.

A cover test was performed on both groups. The nursing home population (group A) had a 95% passing rate while the non-nursing home population (group B) had a 97% cover test passing rate.

Over-refraction statistics, shown in Table 3,are percentages for all age levels.

Table 3 Over-Refraction (%of subjects)

Diopters	>+3.00		+3.00 to +1.25,		+/-1.00		-1.25 to -3.00,		>-3.00	
Age(total #)	A	B	A	B	A	B	A	B	A	B
<65 (A=5,B=7)	0	0	20	0	60	100	20	0	0	0
65-74(A=7,B=9)	0	1	0	3	100	96	0	0	0	0
75-84(A=12,B=77)	9	0	0	2	91	91	0	6	0	1
>85 (A=18,B=21)	0	0	6	6	88	88	6	6	0	0

Groups A and B were respectively divided into 5 different over-refraction levels, +1.00D to -1.00D, +1.25D to +3.00D, -1.25D to -3.00D, greater then +3.00D and greater then -3.00D. 100% of group B less than 65 years old were within the +1.00D to -1.00D level in their over-refraction while only 60% of group A were in this same category. 20% of group A were within the +1.25D to +3.00D level and another 20% of group A were in the -1.25D to -3.00D level. For those 65 to 74 years old, group A had 100% within the +1.00D to -1.00D level, group B had 96% in this same level. 3% of group B were within +1.25D to +3.00D level, leaving 1% of group B in the greater than +3.00D level. Both groups A and B had 91% of all 75 to 84 year olds within the +1.00D to -1.00D level. The remaining 9% of group A were greater than +3.00D in

their over-refraction. Group B had 2% in the +1.25D to +3.00D level, 6% in the -1.25D to -3.00D level and 1% greater than -3.00D. For those 85 years or older, again both groups were equal with 88% within the +1.00D to -1.00D level. Group A and B both had 6% in the +1.25D to +3.00D level and another 6% in the -1.25D to -3.00D level.

Table 4 shows a listing of intraocular pressures (IOP) as obtained by non-contact tonometry.

Table 4 Tonometry (%of subjects)

Pressures (mmHg)	<20		>21		Asymmetry >4	
Age(total #)	A	B	A	B	A	B
<65 (A=8,B=8)	63	63	0	25	37	12
65-74(A=8,B=90)	100	84	0	8	0	8
75-84(A=13,B=83)	100	79	0	11	0	10
>85 (A=18,B=16)	95	74	5	0	0	26

Again, groups A and B were divided into the same age groups as before and placed into 1 of 3 IOP categories. Category 1-less than or equal to 20mmHg, Category 2-21 or greater mmHg, Category 3-an asymmetrical IOP between the 2 eyes of greater than or equal to 4 mmHg. For the age group less than 65 years old, both groups A and B had 63% with IOP's of 20mmHg or less. Group B had 25% with IOP's 21mmHg or greater and 12% with asymmetrical IOP's. We found that group A had 37% with asymmetrical IOP's. Within the next age level, 65-74 years old, group A had 100% with 20mmHg or below while group B only had 84% in this category. The remaining 16% was divided evenly in the other 2 categories. Group A, within the 75 to 84 age level, once again had 100% within the normal IOP range while group B had 79% in this normal range. Group B had 11% in category 2 (21mmHg or higher) and 10% in Category 3 (asymmetrical IOP's). In the most aged group, 85 years or older, 95% of group A had normal pressures while 74% of group B were in this same category. 5% of group A had IOP's of 21mmHg or higher. Group B in this age group had 26% with asymmetrical IOP's.

Ophthalmoscopy was performed with an direct ophthalmoscope on every subject, a pass/fail criteria was set, Table 5 shows the results of these tests.

Table 5

Ophthalmoscopy	**Failed(%)**		**Reasons for failure(%)**		
Age(total#)	A	B		A(37subjects)	B(39subjects)
<64 (A=5,B=8)	20	13	Cataracts	76	59
65-74(A=8,B=90)	62	19	ARMD	19	18
75-84(A=14,B=82)	93	26	Other	5	23
>85 (A=19,B=18)	79	39			

Of the age group under 65, group A had a passing rate of 80% while group B had a pass rate of 87%. In the next age level (65 to 74) 38% passed of group A while 81% passed in group B. Only 7% passed ophthalmoscopy in group A and 74% passed in group B in the 75 to 84 age level. The 85 or older age level show group A with a 21% passing rate, group B with a 61% pass rate. Of the total number who failed in group A, 76% failed due to cataracts, 19% failed with Age-Related Macular Degeneration (ARMD) and 5% failed because of various other ocular pathologies. Of the total number who failed from group B, 59% due to cataracts, 18% to ARMD and 23% to other ocular pathology. Table 6 shows a general trend of the diseases of the subjects of both groups A and B.

Table 6	**Medical History (%of subjects)**	
Group	A	B
Hypertension	19	29
Diabetes	10	4
Arthritis	2	10
CVD	2	13
Glaucoma	6	3
Other	8	2

Hypertension was the most prevalent of both groups A and B with 19% and

29%, respectively. 10% of those in group A (nursing home) had diabetes as compared to only 4% of group B (non-nursing home). 2% of group A as compared to 10% of group B had arthritis. Cardiovascular disease showed 2% with group A and 13% with group B. 6% of those screened in group A mentioned having glaucoma as did 3% of group B. 8% of group A mentioned other less common diseases as did 2% of group B.

All of the previous results were compiled and analyzed by the advising Doctor of Optometry. A subjects overall failure was based on failure of any one of the six categories, or based on history (mainly due to length of time of last full eye examination.)

Table 7 Failure Rates of Screening (%of subjects)

Age(total #)	A	B
<65 (A=7,B=8)	67	37
65-74(A=8,B=89)	75	34
75-84(A=14,B=84)	93	50
>85 (A=19,B=23)	90	44

For those under 65 years of age, the failure rate for groups A and B were 67% and 37%. For those 65 to 74 years of age the fail rate was 75% and 34%, respectively. The next age level (75-84) had a fail rate of 93% in group A, while group B was 50%. In our last age level, 85 or older, 90% in group A and 44% of those in group B failed.

DISCUSSION

With respect to distance visual acuity the only note worthy trends were in the 75-84 age group with nursing home residents having the poorest acuities. Probable reasons are lenticular and media opacities. Near acuities were substantially different with all age groups and categories showed poorer results in nursing home residents. Near corrections were not routinely checked. Almost all subjects passed the cover test in both groups. Suggesting that only strabismic conditions caused failures even

though anything greater than 15 prism diopters of either eso or exophoria should have failed. Aberrant phoric postures in this age group were considered of less clinical significance. Only gross categories were used to divide over-refractions with the vast majority falling between +/- I.00 diopter of plano. Lost in this statistic are +/-.75 to +/-.50 diopter refractive errors that might improve acuity. Surprisingly, intraocular pressures were higher and had more asymmetry in the community seniors. Ages below 65 and above 85 showed the most aberrant findings. Our nursing home population showed a 6% finding of diagnosed glaucoma which correlates well with the national average of 5.2% 7. The individuals falling into our risk categories were felt to be in need of further assessment. Pressures for group A were measured using a hand-held Keeler non-contact tonometer which has shown lower measurements in the higher IOP ranges compared with other tonometers, according to Kohl.8 Conventional non-contact tonometry was used in groupB. Above the age of 65 most subjects in group A failed ophthalmoscopy with the highest failure rate in the age group 75-84 with 93%. The tremendous difference in the failure rates between group A and B shows a void in eye-care, much of which could be filled by routine examinations. Both groups showed trends toward more failures with increasing age, with group A being more consistent. Results such as these show a tremendous need for further and continuous assessment of existing conditions. All ophthalmoscopy was done under non-dilated conditions with pupil size, cataracts, and media opacities making evaluation of the retina difficult. Reasons for the failures, if documented, showed cataracts to be in the majority with age-related macular degeneration coming next. In most cases multiple degenerative or pathological entities were present.

Prevalence of systemic diseases between this study and the general population correlate well, with national rates of hypertension and diabetes for this age group being 15% and 10% respectively 9,10 . Confounding this information was the inability to obtain accurate medical histories, all medical information was gathered by patient interview.

Advising doctors were responsible for reviewing all information obtained from the screening and gave an overall pass/fail judgement. One of the most dramatic findings within our study was in this area. The nursing home population had nearly double the failure rate of the community seniors in every age group. This strongly demonstrates the void that needs to be filled by eye-care professionals.

Weaknesses in this study were found in several areas. First, in the low subject numbers and in the process of their selection. Improvements would be to increase the number of subjects and to have greater random selection within the nursing homes. Second, ocular health was very difficult to assess under non-dilated conditions. Due to possible drug interaction and the non- invasive screening nature of this study, dilation was rejected. Lastly, subject interviews were an inadequate means of obtaining the patient's past medical history. Full access to medical records would be recommended for any future screenings.

Conclusion

The objective of our study was to determine the optometric needs, if any, of the geriatric nursing home population and compare that need with that of the non-nursing home senior age group. This study vividly points out that the visual potential of the nursing home residents are not being met. We are not suggesting that perfect vision is obtainable for every resident, but we could raise the level of care so their vision falls within the standard of what is expected for their age group. With even minimal optometric care, there are many who could benefit and upgrade their way of life. For many of these residents just being able to watch television or read a newspaper more comfortably would be a tremendous help and could possibly decrease the level of supervision which they currently require. There is virtually an untapped market for the eye-care professional, even the established practitioner could substantially increase their patient base but beyond the financial rewards is the personal satisfaction of caring for individuals that are in the greatest need and least able to obtain your

valuable ocular care. The rewards of such an endeavor would far outweigh the difficulty in caring for this population.

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